

BiSFP-D2-80-PLU / BiSFP-U2-80-PLU*

RoHS Compliant 1.25G 1490/1550nm(1550/1490nm) 80km Transceiver

Product Features

- Supports 1.25Gbps/1.0625Gbps bit rates
- Bi-Directional LC connector
- Hot pluggable SFP footprint
- 1490nm DFB laser and 1550nm PIN photo detector
- 1550nm DFB laser and 1490nm PIN photo detector
- Applicable for 80Km SMF connection
- Low power consumption, < 1.0W
- Digital Diagnostic Monitor Interface
- Compliant with SFP MSA and SFF-8472
- Very low EMI and excellent ESD protection
- Operating case temperature:

Commerical: 0 to 70 °C

Industrial: -40 to 85 °C

Applications

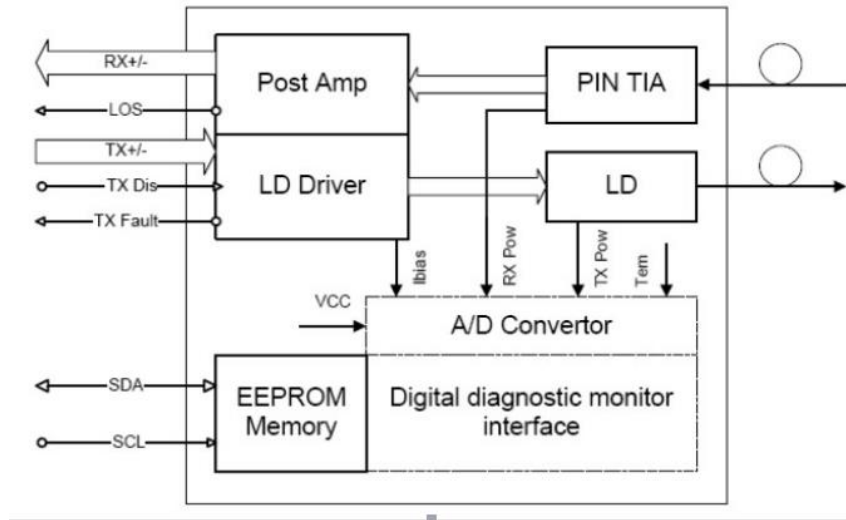
- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other Optical Links

Product Descriptions

PlusOptic, SFP-BIDI transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 80km transmission distance with SMF. The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

* Part numbers ending in "i" refer to the Industrial variant of the part. This spec sheet is also for other vendor compatible units with the last 3 digits of the part number varying based on vendor code. Please see the last page of this specification sheet for a list of vendor codes.

Functional Diagram



Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature	Ts	-40	85	°C	
Relative Humidity	RH	0	85	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the transceiver.

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	DR	1.0625	1.25		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Iccs			280	mA	
Operating Case Temp.	Tc	0		70	°C	
	Tl	-40		85		

Electrical Characteristics (T_{OP(C)} = 0 to 70 °C, T_{OP(I)} = -40 to 85 °C, V_{CC} = 3.13 to 3.47 V)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Differential data input swing	V _{IN,PP}	120		820	mVpp	1
Tx Disable Input-High	V _{IH}	2.0		V _{CC} +0.3	V	
Tx Disable Input-Low	V _{IL}	0		0.8	V	
Tx Fault Output-High	V _{OH}	2.0		V _{CC} +0.3	V	2
Tx Fault Output-Low	V _{OL}	0		0.8	V	2
Input differential impedance	R _{in}		100		Ω	
Receiver						
Differential data output swing	V _{out,pp}	340	650	800	mVpp	3

Rx LOS Output-High	V _{ROH}	2.0		V _{cc} +0.3	V	2
Rx LOS Output-Low	V _{ROL}	0		0.8	V	2

Notes:

1. TD+/- are internally AC coupled with 100Ω differential termination inside the module.
2. Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and V_{cc}+0.3V.
3. RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

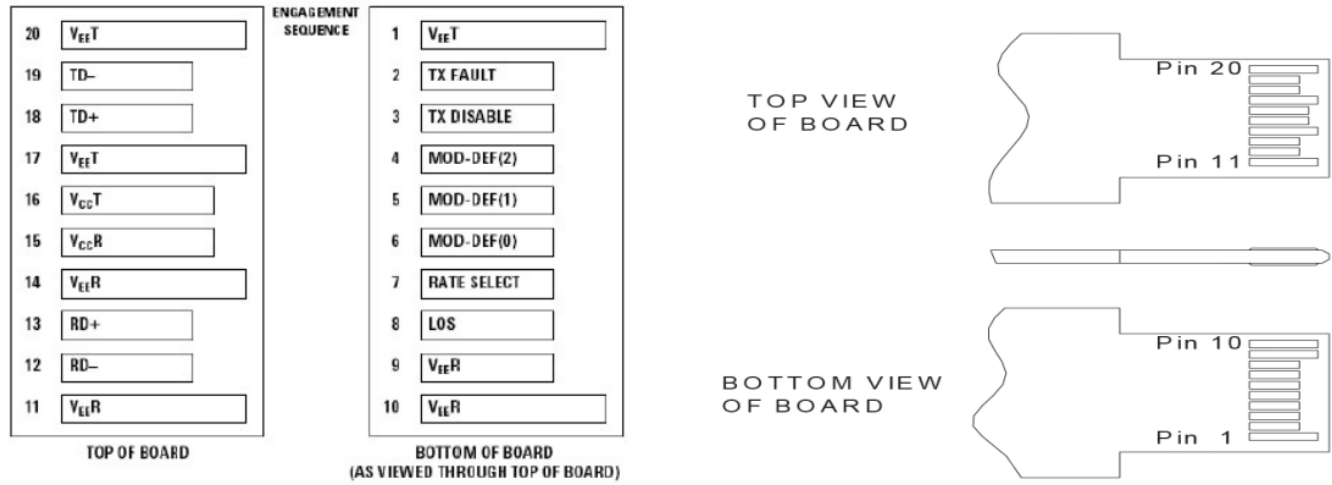
Optical Characteristics (T_{OP(C)} = 0 to 70 °C, T_{OP(I)} = -40 to 85 °C, V_{CC} = 3.13 to 3.47 V)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λ	1470	1490	1510	nm	
		1530	1550	1570		
Ave. output power (Enabled)	P _{AVE}	-3		2	dBm	1
Extinction Ratio	ER	9			dB	1
Side-Mode Suppression Ratio	SMSR	30			dB	
RMS spectral width	$\Delta\lambda$			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ns	2
Dispersion penalty	T _{DP}			3.9	dB	
Output Optical Eye	Compliant with IEEE802.3 z (class 1 aser safety)					
Receiver						
Operating Wavelength	λ	1530	1550	1570	nm	
		1470	1490	1510		
Receiver Sensitivity	P _{SEN1}			-28	dBm	3
Overload	P _{AVE}	-3			dBm	3
LOS Assert	Pa	-37			dBm	
LOS De-assert	Pd			-29	dBm	
LOS Hysteresis	Pd-Pa	0.5			dB	

Notes:

1. Measured at 1250Mb/s with PRBS 2²³⁻¹ NRZ test pattern.
2. Unfiltered, measured with a PRBS 2²³⁻¹ test pattern @ 1.25Gbps
3. Measured at 1250Mb/s with PRBS 2²³⁻¹ NRZ test pattern for BER < 1x10⁻¹²

Pin Defintion And Functions



Pin	Symbol	Name/Description	Notes
1	V _{EE} T	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active “H”	1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on “H”	2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	3
6	MOD-DEF0	Model present indication	3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active “H”	4
9	V _{EE} R	Rx ground	
10	V _{EE} R	Rx ground	
11	V _{EE} R	Rx ground	
12	RD-	Inverse received data out	5
13	RD+	Received data out	5
14	V _{EE} R	Rx ground	
15	V _{CC} R	Rx power supply	
16	V _{CC} T	Tx power supply	
17	V _{EE} T	Tx ground	
18	TD+	Transmit data in	6
19	TD-	Inverse transmit data in	6
20	V _{EE} T	Tx ground	

Notes:

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.

2. TX disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7 – 10KΩ resistor. Its states are:

Low (0 – 0.8V): Transmitter on ($>0.8, < 2.0V$): Undefined
High (2.0V~V_{CC}+0.3V): Transmitter Disabled Open: Transmitter Disabled

3.Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.

Mod-Def 0 has been grounded by the module to indicate that the module is present

Mod-Def 1 is the clock line of two wire serial interface for serial ID

Mod-Def 2 is the data line of two wire serial interface for serial ID

4.When high, this output indicates loss of signal (LOS). Low indicates normal operation.

5.RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.

6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Digital Diagnostic Specifications

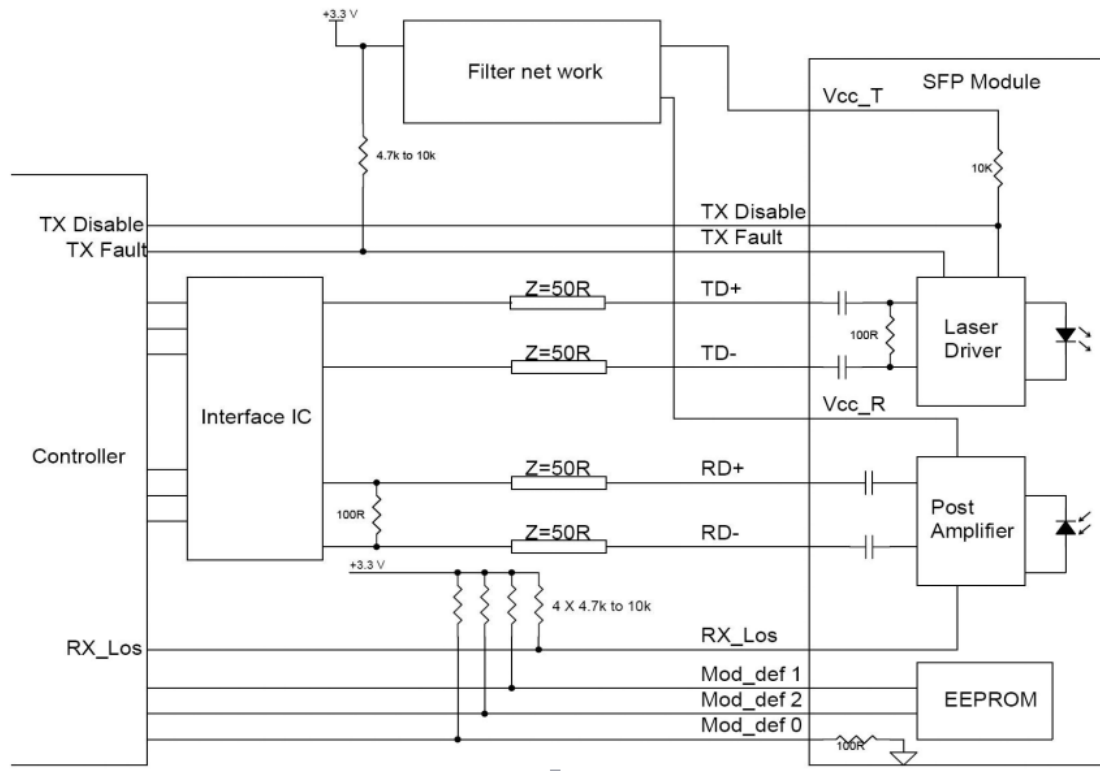
The BIDI-SFP-D2-80KM-PLU / BIDI-SFP-U2-80KM-PLU transceivers can be used in host systems that require either internally or externally calibrated digital diagnostics.

Parameter	Symbol	Units	Min.	Max.	Accuracy	Note
Transceiver temperature	DTemp-E	°C	-45	+90	±5°C	1
Transceiver supply voltage	DVoltage	V	2.8	4.0	±3%	
Transmitter bias current	DBias	mA	2	80	±10%	2
Transmitter output power	DTx-Power	dBm	-6	+5	±3dB	
Receiver average input power	DRx-Power	dBm	-31	0	±3dB	

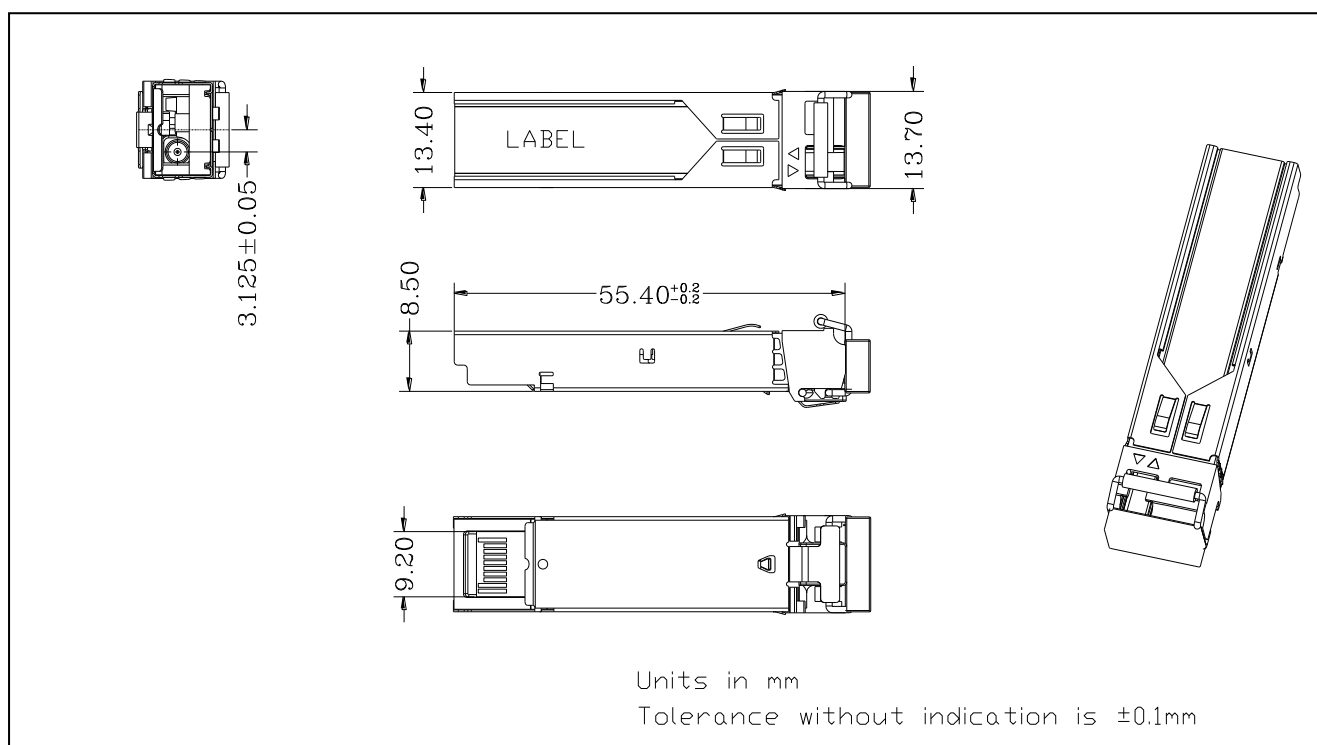
Notes:

- 1.When Operating temp.=0~70 °C,the range will be min=-5,Max=+75
2. The accuracy of the Tx bias current is 10% of the actual current from the laser driver to the laser
3. Internal/ External Calibration compatible.

Typical Interface Circuit



Package Dimensions



Wavelength	Latch Color
TX 1490nm	Violet
TX 1550nm	Yellow

Ordering Information

Part Number	Description
BiSFP-U2-80-PLU	SFP BIDI,1.25G ,1490/1550nm ,80Km,0~70°C, with Digital Diagnostic Monitor
BiSFP-D2-80-PLU	SFP BIDI,1.25G ,1550/1490nm ,80Km,0~70°C, with Digital Diagnostic Monitor
BiSFP-U2-80-PLUi	SFP BIDI,1.25G ,1490/1550nm ,80Km,-40~85°C, with Digital Diagnostic Monitor
BiSFP-D2-80-PLUi	SFP BIDI,1.25G ,1550/1490nm ,80Km,-40~85°C, with Digital Diagnostic Monitor

VIII. Ordering Information

When ordering, to choose the vendor you require such as Cisco, HP, Juniper etc you need to replace the 'XXX' at the end of each SKU with the relevant 3 digit vendor code, for instance if you wanted a Cisco Multimode 1.25Gb SFP then the SKU would read SFP-1G-550M-MMD-CIS.

VENDOR	CODE	VENDOR	CODE	VENDOR	CODE	VENDOR	CODE
3com	3CO	Cyan	CYN	Huawei	HUA	PlusOptic	PLU
Adtran	ADT	Compaq	COM	IBM	IBM	Q-logic	QLO
Alcatel-Lucent	ALC	Dell	DEL	Intel	INT	QNA	QNA
Allied Telesis	ATE	Delta	DTA	JDS Uniphase	JDS	RAD	RAD
Allnet	ALL	D-LINK	DLI	Juniper	JUN	Redback	RED
Arista Networks	ARI	EMC	EMC	LVN	LVN	Riverstone	RIV
Aruba Networks	ARU	EMU	EMU	Linksys	LIN	Silicom	SIL
Asante	ASA	Enterasys	ENT	Marconi	MAR	Smartoptic	SMO
Avago	AVA	Extreme	EXT	McAfee	McA	SMC	SMC
Avaya	AVY	F5 Networks	F5	Meraki	MER	Solarflare	SLF
Black Box	BLK	Finisar	FIN	Milan Techn	MIL	Sun	SUN
Blade	BLA	Fluke	FLU	Moxa	MOX	SuperMicro	SUP
Bluecoat	BLU	Force 10	F10	NetAPP	NAP	Telco	TEL
Broadcom	BRD	Fortinet	FOR	Netgear	NET	TP-Link	TPL
Brocade	BRO	Foundry	FOU	Nortel	NOR	Transition	TRA
Calix	CAL	Fujitsu	FUJ	Packeteer	PKT	Trendnet	TRE
Ceragon Networks	CRN	Gigamon	GIG	PacketLight	PKL	Voltaire	VOL
Check Point	CHE	H3C	H3C	Palo Alto	PAL	WGD	WGD
CHL	CHL	HIR	HIR	Penguin	PEN	WES	WES
Ciena	CIE	HP	HP	Perle	PER	ZTE	ZTE
Cisco	CIS	HP ProCurve	HPP	PicoLight	PIC	ZYXEL	ZYX
Citrix	CIX	Huawei	HUA	Planet	PLA		